

BOM

RONJA Tetrapolis form for making Bill of Tools and Materials

Items 300

Sites 2

Tools

Qt	Description
2	Brush for hand-washing (not mandatory)
2	Brush or sponge for floor washing
2	Bucket for floor washing
2	Calculator
2	Calibrated printer
2	Caliper
2	Centre punch
2	Cold chisel, small (roughly 15mm wide), sharp
2	Compasses (pair)
2	Crimp tool for RJ-45 connector if you don't have a pre-crimped cable
2	Drill bit, HSS: (3.5+1.5-0.5)mm
2	Drill bit, HSS: 3.2mm
2	Drill bit, HSS: 3.3mm
2	Drill bit, HSS: 3.5mm
2	Drill bit, HSS: 4.0mm
2	Drill bit, HSS: 4.1mm
2	Drill bit, HSS: 4.3mm
2	Drill bit, HSS: 5.0mm
2	Drill bit, HSS: 5.1mm
2	Drill bit, HSS: 5.4mm
2	Drill bit, HSS: 5.5mm
2	Drill bit, HSS: 6.0mm
2	Drill bit, HSS: 6.4mm
2	Drill bit, HSS: 6.5mm
2	Drill bit, HSS: 7.0mm
2	Drill bit, HSS: 8.5mm
2	Drill bit, HSS:10.0mm
2	Drill bit, HSS:10.5mm
2	Drill bit, masonry, 12mm
2	Drill stand (recommended)
2	Electric drill with chuck that can hold 12mm drill bit diameter. If mounting on a concrete wall, it must be a hammer drill.
2	File, flat
2	Forceps
2	Hammer
2	Handsaw for metal
2	Hard-metal tip stylus or awl

BOM

2	Hot glue gun (can be replaced by silicone sealant for expense of much longer curing)
2	Jig saw (Optionally if you want to cut the front cap the mechanized way.)
2	Knife
2	Lamp, bright
2	Loupe, small
2	Marker pen for non-porous material with 0...1mm thick trace
2	Metal cutting handsaw
2	Multimeter (ohmmeter)
2	Needle
2	Paintbrush (1.5" wide optimum)
2	Paintbrush, 0.5 inch
2	Paintbrush, small (roughly 30mm wide), preferrably angled
2	Pencil
2	Pliers, flat, best with narrow end
2	Pliers, tin bending
2	Pliers, wire bending
2	Pliers, wire cutting
2	Pliers, wire stripping
2	Ruler
2	Scissors, paper
2	Scissors, tin
2	Screwdriver, 3mm
2	Screwdriver, flat for M3 bolts (if heads are cheese)
2	Screwdriver, flat for M4 bolts (if cheese heads are used)
2	Screwdriver, philips if some of the bolts are Philips head
2	Shears, tin
2	Slide gauge (recommended)
2	Soldering iron (powerful for soldering boxes, 125W gun is recommended)
2	Square (recommended)
2	Tape measure
2	Thermal glue gun
2	Toothbrush, old
2	Tray, plastic. No kitchenware! For PCB variant only.
2	Tub, for washing parts
2	Tweezer
2	Vice, big
4	Wrench 10mm for M6
4	Wrench 13mm for hex head M8 bolts (or Wrench 13mm 1 pc. + Wrench Allen 6mm 1 pc.)
4	Wrench 16mm (they sometimes make the M10 hex head 16mm)
4	Wrench 17 mm
2	Wrench 5.5mm for M3 nuts
4	Wrench 7mm for M4 nuts
2	Wrench 8mm (for switches). Check size of the hex on your switches, they may differ.
2	Wrench, Allen, for the M6 bolts if you have Allen head
2	Wrench, Allen, if some of the bolts are Allen head.

BOM

Materials

Type	Qt	Description
Chemistry	960 g	Detergent and hot water for removing fat
Chemistry	600 g	Emulsion (from water, soap and edible oil) for cutting
Chemistry	900 g	Glue, water-soluble for sticking paper on metal
Chemistry	420 l	Isopropyl alcohol. For washing printed circuit boards (PCB variant only).
Chemistry	80 l	Paint, primer, anti-corrosive, outdoor, any colour, water-soluble
Chemistry	16 l	Paint, top, black colour, water-soluble, matte
Chemistry	65 l	Paint, top, white colour, water-soluble, matte or glossy
Chemistry	120 Kg	Silica gel, 0.2kg
Chemistry	1800 cm†	Silicone sealant when thermal glue gun is not available, neutral base (acetic base not allowed). White or transparent or black or other color.
Electrician	13000 m	Cable, shielded coaxial (RG58 or radio or TV coax) Note 1
Electrician	9000 m	Cord, length of any insulated double-conductor. Thick insulation recommended for outdoor mounting. Length according to distance between computer and optical heads.
Electrician	1500 U	DE9 connector (commonly misspelled ad DB9), female, for cable, with metallic or metalized covers. If two coaxials fit into one connector, 1 piece, otherwise 2 pieces.
Electrician	60 m	Duct tape, black
Electrician	30 m	Duct tape, blue
Electrician	60 m	Duct tape, red
Electrician	30 m	Duct tape, white
Electrician	300 U	Lightning rod clamp plate/wire
Electrician	300 U	Lightning rod clamp wire/wire
Electrician	300 U	Lightning rod clamp wire/wire or plate/wire (depends on available grounding point)
Electrician	300 U	Lightning rod conductor, as long as the distance between the console and adjacent suitable grounding point, plus distance between the consoles
Electrician	1800 g	Rosin flux
Electrician	1800 g	Solder, preferably lead-free
Electrician	300 U	Solderable eyelet with hole for M6 bolt
Electrician	1500 T	Wire nut, for 4mm†wire, 2-terminal piece
Electrician	4800 T	Wire nut, for 4mm†wire, 8-terminal piece
Electrician	30 m	Wire, copper, solid, 0.5mm†– 1mm†
Electrician	60 m	Wire, copper, solid, 1.5mm†
Electrician	60 m	Wire, copper, solid, 2.5mm†
Electrician	110 m	Wire, copper, solid, 4mm†
Electrician	162 m	Wire, copper, solid, insulated, 1mm†
Electrician	120 m	Wire, copper, solid, insulated, 4mm†
Electrician	6 m	Wire, copper, solid, thin, small piece
Electrician	6 m	Wire, copper, solid, uninsulated, 4mm†

BOM

Electrician	18	m	Wire, copper, thin (as thin as resistor's leads), bare, short piece
Electrician	300	m	Wire, insulated 1.5mm ² single-conductor cord
Electrician	390	m	Wire, insulated double-conductor or something similar, 2x1.5mm ²
Electrician	300	m	Wire, insulated, stranded, single-conductor, $\geq 1\text{mm}^2$ crossection
Electrician	78	m	Wire, shielded, stranded, single-conductor cord with solderable shield
Electrician	60	m	Wire, stranded, double-conductor cord, 1.5mm ² each conductor
Electronics	300	U	12V power supply of these requirements: DC, Regulated, Rated 300mA or more, Doesn't give more than 3A into short circuit, Short circuit or overload of unlimited duration doesn't cause damage or fire hazard
Electronics	1200	U	Box, shielding, tin-plated, 92x67x22 with lids (U-AH102)
Electronics	1500	U	Cable grommet 6mm inner diameter for 8mm hole
Electronics	2700	U	Cable grommet 8mm inner diameter for 10mm hole
Electronics	600	m	Cable, Shielded Twisted Pair (STP), flexible (stranded), 2m . Best is to buy 2m straight (not crossed) patch cable and cut in half. Otherwise RJ45 plug (for stranded cables - there are two different types of RJ45 plugs!), connector jacket
Electronics	600	U	Can, Tin plated steel sheet metal, 90x67x22mm
Electronics	900	U	Distance piece for LED, straight, 10mm
Electronics	300	U	F 200mA fuse
Electronics	300	U	Fuse housing (for soldering on a wire)
Electronics	2400	U	Resistor, 8.2 Ohm, 0.5W, non-SMD. These are for 12V heating source and RX and TX head in series, each head getting 1.125W of heating. Recompute at your will for other connection (parallel, more Ronja's in series, more Ronja's in paralel etc.) or for different heating power supply voltages.
Electronics	8	Kg	Rosin flux
Electronics	8	Kg	Solder, preferably lead-free
Electronics	300	g	Thermal silicon paste (for mounting semiconductors on coolers). This is not the silicone putty (sealant) or silicagel!
Electronics	300	U	Wall cube 12V / 200mA (for 220 VAC / 50Hz, 120 VAC / 60Hz or whatever you have in your country in your wall outlets). May be stabilized or unstabilized. May be DC or directly AC. Any simple transformer suffices if is capable of permanent running without human attention and without a risk of causing fire. The heating subsystem consumes 2.25 Watts of power. Any other transformer suffices too provided that is capable of continuous 2.4 Watt delivery and the resistors in Ronja 130mm Tubular Head or Ronja 90mm Tubular Head are replaced accordingly for appropriate values other than default 8.2-Ohm resistors.
Household	30	U	Block from hard wood to support the chiseled part in a vice
Household	30	U	Board, wooden, a large junk or plaster board (will be trashed), if you want to employ mechanized way of cutting out front lids
Household	30	U	Rag for cleaning soldering iron
Household	30	U	Toothbrush, old but clean
Ironmonger's	1800	U	Blocks, rubber, round, 20mm thick, 25mm wide, without a hole in the middle. The rubber must withstand the weather, i. e. it must be black rubber, not pink rubber. If you can get pink rubber only, buy 30mm wide ones.

BOM

Ironmonger's	1500	U	Emery paper, rough, for grinding off rust and paint
Ironmonger's	1200	U	Smoke pipe caps, 145mm nominal diameter
Ironmonger's	600	U	Smoke pipe, 115mm+focus piece of 145mm nominal diameter
Nuts and bolts	2400	U	Bolt 8mm dia. for 12mm wall plug, hex or allen head
Nuts and bolts	600	U	Bolt M10x40, galvanized, hex or Allen head
Nuts and bolts	1200	U	Bolt M8x35, galvanized, hex or cheese or Allen head
Nuts and bolts	600	U	Nut M10, galvanized
Nuts and bolts	1200	U	Nut M8, galvanized
Nuts and bolts	2400	U	Wall plug, 12mm, plastic
Nuts and bolts	2400	U	Washer M8 (8.4mm), galvanized
Nuts and bolts	600	U	Washer, spring, toothed M10 (10.5mm), galvanized
Nuts and bolts	1200	U	Washer, spring, toothed M8 (8.4mm), galvanized
Nuts, bolts, and washers	600	U	Bolt M10x60 high-strength (e.g. 8.8 instead of 5.8), galvanized, hex head
Nuts, bolts, and washers	600	U	Bolt M3x(10+6-0), with thread up to the head, hex or Allen or Philips or cheese head.
Nuts, bolts, and washers	2400	U	Bolt M3x(15+5-2), galvanized, hex or Allen or cheese or Philips head
Nuts, bolts, and washers	300	U	Bolt M3x(6+4-0), galvanized, hex or Allen or Philips or cheese head
Nuts, bolts, and washers	600	U	Bolt M3x10 with thread to head, hex or Allen or Philips or cheese head
Nuts, bolts, and washers	1200	U	Bolt M4x(30+5-2) countersink head, Philips or cheese
Nuts, bolts, and washers	1200	U	Bolt M4x15 with thread to head, galvanized, hex or Allen head
Nuts, bolts, and washers	4800	U	Bolt M4x8, galvanized, hex or Allen head
Nuts, bolts, and washers	1200	U	Bolt M6x(8mm L-section=16, 10mm L-section=18, 12mm L-section=20)+4-0, galvanized, hex or Allen head
Nuts, bolts, and washers	3000	U	Bolt M6x14, galvanized, hex or Allen head
Nuts, bolts, and washers	3000	U	Bolt M8x(50+10-0) with max. 10mm of threadless part, galvanized, hex or Allen head
Nuts, bolts, and washers	2400	U	Bolt, self-cutting, 4x10, Philips or cheese or hex or Allen head
Nuts, bolts, and washers	1800	U	Nut (jam) M8, galvanized
Nuts, bolts, and washers	600	U	Nut M10, galvanized
Nuts, bolts, and washers	6300	U	Nut M3, galvanized
Nuts, bolts, and washers	1200	U	Nut M4, brass or galvanized (20 minut time penalty)
Nuts, bolts, and washers	1200	U	Nut M4, brass. Zinc plated with 20min. time penalty.
Nuts, bolts, and washers	10800	U	Nut M4, galvanized
Nuts, bolts, and washers	4200	U	Nut M6, galvanized
Nuts, bolts, and washers	1200	U	Nut M8, galvanized
Nuts, bolts, and washers	2400	U	Washer M3 (3.2mm), galvanized
Nuts, bolts, and washers	16800	U	Washer M4 (4.3mm), galvanized
Nuts, bolts, and washers	600	U	Washer, spring, toothed M10 (10.5mm), galvanized
Nuts, bolts, and washers	4200	U	Washer, spring, toothed M6 (6.4mm), galvanized
Nuts, bolts, and washers	1200	U	Washer, spring, toothed M8 (8.4mm), galvanized
Nuts, bolts, and washers	300	U	Washer, spring, toothed, M3 (3.2mm), galvanized

BOM

Optics	600	U	Loupe lens, glass, 130mm diameter, 295mm focal length. Other focal lengths are possible, as the guide is written referring to a variable "focus", which is the actual length of the lens you managed to get. Some lenses are greenish or blueish. Try to pick out the most clear ones as the colouring will generate some optical attenuation. The range is specified for clear lenses.
Sections	120	m	Bar, solid, steel, square, 25x25
Sections	210	m	Bar, steel, flat, 20x4 (CSN 42 5522)
Sections	72	m	Bar, steel, flat, 90x8, DIN 1017, 120mm. May be substituted with 90x10 or 90x12
Sections	54	m	L-section, steel, 100x100x8, DIN 1029, 90mm. May be substituted with 100x100x10 or 100x100x12.
Sections	4	m	L-section, steel, 20x20x3 (to use as a helper for bending tin, recommended)
Sections	180	m	L-section, steel, rolled, 70x70x6mm or 70x70x7mm (DIN 1028, ČSN 42 5541, EN 57 10056)
Sections	210	m	U-section, steel, open, thin-walled, 25x25x2mm (CSN 42 6963)
Sections	90	m	U-section, steel, rolled, 50mmx38mm (DIN 1026, ČSN 42 5570)
Tins	234	m†	Plate, metal, rectangular, 0.3mm steel with or without any coating or dural, 0.5mm aluminium or copper
Tins	330	m†	Tin (plated or unplated) steel sheet, dural, aluminium, copper 0.3...1mm thick

Note 1

Coaxial Cable Requirements:

- Weatherproof.
- Both inner wire and outer wire must be solderable.
- Stranded wire is preferred for the inner wire. solid wire increases the risk of breaking.
- If the inner wire is a solid wire, it must not be plated (galvanized).
- Interwoven shielding is preferred to spiral one.
- Other type of cable, especially UTP or STP, is not allowed!
- RG58 or radio or TV coax